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ABSTRACT

An attempt to measure responsibility for the effects of careful or careless driving involved the development of a scale for driving locus of control (DLOC). An early version of the DLOC was given to 43 college students. Preliminary results indicated that test-retest reliability and internal consistency were high enough to warrant further development. On a repeat testing, scores of internal responsibility were significantly higher following the presentation of a film concerning the effects of drunk driving. The current version of the DLOC was derived from the responses of 55 high school students to 100 forced-choice items in a second study. Two forms of the DLOC, each containing 15 forced-choice items and 5 fillers, were developed from the responses. The two forms were administered to 266 high school students in a third study. Subjects also completed the Alcohol Expectancy Questionnaire (AEQ) and the Children's Depression Inventory (CDI). The results revealed a high correlation between Forms A and B, and high internal consistency of each form. Scores on internal responsibility were significantly more internal following presentation of the film on drunk driving. No factors on the AEQ were significantly related to the DLOC, but scores on the CDI were correlated with the DLOC. The DLOC is currently being used in a larger study aimed at developing an educational program to be used in high schools to teach responsible driving. References and tables are provided and the two forms of the DLOC are included as an appendix. (Author/NRB)

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Responsibility for Drinking and Driving in Adolescents

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Abstract

The construct of locus of control, which grew out if Rotter's social learning theory, has had wide applicability in a variety of settings. Basically, the variable refers to the expectancy that reinforcements occur as a consequence of one's own behavior (internal) or, alternatively, as the result of some external force such as fate, luck chance, or the influence of others.

While Rotter initially conceived of this construct as a generalized expectancy, much recent research has been directed toward developing goal-specific locus of control measures. Thus scales have been designed to measure locus of control in such diverse areas as health, weight control, mental health, academic achievement, and drinking behavior.

A recent attempt to measure responsibility for the effects of careful or careless driving has involved the development of a scale for driving locus of control (DLOC). An early version of the DLOC which contained twenty items of a forced-choice type and eight fillers, was given to 43 college students (Study I). Preliminary results were encouraging: test-retest reliability and internal consistency were high enough to warrant further development. Furthermore, on a repeat testing, scores of internal responsibility were significantly higher following presentation of a fifteen minute film concerning the effects of drunk driving.

The current version of the DLOC is derived from the responses of 55 high school students to 100 forced choice items (Study II).

Alternate forms of the DLOC were developed from these responses. Each form contains 15 forced choice items and 5 fillers.

The two forms were given to another group of 266 high school students (Study III). The correlation between Form A and B was high as was the internal consistency of each of the forms. Again, as with the college students in Study I, scores on internal responsibility were significantly more internal following presentation of the film concerning the effects of drunk driving.

The relationship between Driver's Locus of Control and both alcohol expectancies and depression have also been explored. No factors on an alcohol expectancy questionnaire were significantly related to Driver's Locus of Control, but scores on the children's depression index were correlated with DLOC.

The DLOC is currently being used in a larger study aimed at developing an educational program to be used in high schools to teach sane, responsible driving. It is hoped that this instrument along with measures of Drinking Locus of Control, Stress and Depression, will shed further light on the inordinately high rate of adolescent alcohol-related traffic accidents.

Responsibility for drinking and driving in adolescents

Most adolescents in the United States can first legally drive a car at the age of 16, although the exact age varies slightly from state to state. The legal age for drinking alcoholic beverages range anywhere from 18 to 21 depending on the state, although a recent presidential initiative would allow the federal government to withhold transportation funds from any state that did not raise its legal drinking age to twenty-one.

Currently the beginning of drinking and the beginning of driving both serve as "rites of passage" for American adolescents; for many they mark the beginning of a long sought after independence. Unfortunately each of these behaviors requires a period of apprenticeship. One does not learn to drive without a period of training and practice, nor does one learn to drink responsibly without some learning, whether by way of modeling or explicit instruction. That these two learning tasks are occurring simultaneously in the developmental histories of many adolescents and that each is seen as an important symbol of adulthood has led to tragic consequences.

Of the fatal traffic accidents which occur yearly in this country over fifty percent are alcohol-related. For persons between the ages of 16 to 24 this percentage rises to almost sixty. In fact, persons in that age range are disproportionately represented in the number of fatal accidents that occur. They are even more disproportionately represented in the number of alcohol related crashes. The largest percentage of their accidents occur at night between the hours of 11 p.m. and 3 a.m. and during the summer months of July and August when most parties occur and when the quest for independence is at its peak.

Several educational programs have been developed which aim at reducing the number of alcohol related traffic accidents among youth. Some of these are alcohol and drug educational programs; others are driver's education courses. In relatively few instances have the two areas of learning been incorporated into a single program. The current research reported here is part of such a program that is being developed for the U.S. Department of Transportation.

Before embarking on an intervention program it was essential to identify and measure those variables that were either suspected or found in earlier research to be related to unsafe or alcohol impaired driving. The

preliminary research has focused on self-esteem, depression, locus of control, stressful life events, and a number of demographic and socio-economic dimensions. The work to be reported here examines the dimension of locus of control.

The construct of locus of control, which grew out of Rotter's Social Learning Theory, has had wide applicability in a variety of settings. Basically, the variable refers to the expectancy that reinforcements occur as a consequence of one's own behavior (internal) or, alternatively, as the result of some external force such as fate, luck, chance, or the influence of others (external). (Rotter, 1966; Lefcourt, 1966,1981,1983).

While Rotter (1966) initially conceived of this construct as a generalized expectancy, much recent research has been directed toward developing goal-specific locus of control measures (Lefcourt, 1981). Thus scales have been designed to measure locus of control in such diverse areas as health (Wallston and Wallston, 1978, 1981, Strickland, 1978; Wallston, Wallston, and DeVellis, 1978), weight control (Saltzer, 1978, 1979), mental health (Hill and Bale, 1981), academic achievement (Crandall, Katkovsky, and Crandall, 1965; Crandall, Katkovsky, and Preston, 1962)

and drinking behavior (Donovan and O'Leary, 1983).

The work that is reported in this paper was aimed at developing an instrument for locus of control for driving behavior. Specifically we were concerned with constructing an instrument that would measure an individual's acceptance of responsibility for the effects of good or poor driving.

Pilot Study

Study 1

Purpose

A twenty-item Driver's Locus of Control scale (DLOC) was written based on Social Learning Theory and current data about driving practices. The scale was intended to assess responsibility for driving behaviors among young drivers. Reliability and validity of the DLOC were assessed. Validity was determined by change scores between two administrations of the DLOC with an intervening presentation of a thirteen minute documentary film depicting negative outcomes of drinking and driving among adolescents. Specifically, it was hypothesized that DLOC scores would decrease (become more internal) after respondents had viewed the film.

Method

Forty-three undergraduate students (13 males and 30 females) taking summer courses at a large midwestern

university participated in this research. They were initially administered the DLOC and a Demographics and Driving Behavior Questionnaire, (DDBQ) which included such descriptive information as the number of years the respondents had been driving, whether they owned their own cars, etc. In addition they were given the Fear of Negative Evaluation Scale (Leary, 1983) to rule out fear as one potential response bias. Four weeks later the subjects viewed the film and immediately afterwards they completed a randomly ordered version of the DLOC. Descriptive statistics for the participants are presented in Table 1.

Insert Table 1 here

Results

Correlations among all the DDBQ variables, the Fear of Negative Evaluation, and the DLOC yielded only three significant values, which did not exceed the number expected by chance. Thus the scores appear to be uninfluenced by fear of being evaluated negatively, nor did driving locus of control appear to relate to any of the demographic variables listed in Table 1.

Reliability of the DLOC was low. Internal consistency scores (Cronbach's alpha) were .39 for the

first administration and .45 for the second.

The validity check of the DLOC yielded significant results. There was a significant decrease in (external) scores from the first to the second administration $t=4.24$; $df=42$; $p < .001$.

Construction of Alternate Forms of DLOC

Study 2

Purpose

This study was an attempt to construct two alternate forms of the DLOC, each consisting of 15 items, with an acceptable internal consistency, alternate forms reliability, and predictive validity. One hundred new items were constructed and together with a revised DDBQ-R (see Table 2) were administered to a second group of high school students. The DLOC was administered to the same subjects on a second occasion four weeks later.

Method

Fifty-five students (25 male and 30 female) from a nearby high school served as subjects. Descriptive statistics for the subjects are given in Table 2.

Insert Table 2 here

Results

The internal consistency for the DLOC was high; Cronbach's alpha = .90. Test-retest reliability was .76. Forty items were then selected on the basis of their item-total correlation on the postest of the DLOC-100. The forty items were divided into two halves yielding two alternate forms. The internal consistency of the two forms was .93 and .94. The two forms were then reduced to fifteen items each by discarding those items with the lowest item-total correlations and the lowest inter-scale correlations. The final 15 item scales appear as DLOC-A and DLOC-B in Appendix A.

Validation of DLOC

Study 3

Purpose

The final study was designed as a further measure of the reliability and validity of the two forms of the DLOC. A measure of depression and an alcohol expectancy questionnaire were administered to a group of high school students along with the DLOC.

Method

The subjects for this study were 266 students (118 males; 148 females) from a local high school. During regular school hour the students were administered a

DDBQ-R, the Crowne-Marlow (1964) Social Desirability Scale a measure of depression, an alcohol expectancy questionnaire, and either Form A (half the subjects) or DLOC-Form B (the other half). Two weeks later the subjects were shown the documentary film used in study 1, and were again given the DLOC. Subjects who received Form A on the first administration were given Form B two weeks later, and vice versa. Internal consistencies were measured with Cronbach's alpha and alternate form reliability was assessed. Correlations with scores on the Children's Depression Inventory and the seven scales of the Alcohol Expectancy Questionnaire were computed. Finally predictive validity was assessed by change scores after viewing a documentary film depicting the effects of alcohol impaired driving.

Results

The correlation between Form A and Form B was high ($r=.67$) as was the internal consistency of each of the forms ($r=.83$ for Form A and .74 for Form B). Again, as with the college students in Study 1 scores on the DLOC were significantly lower (i.e., more internal) following presentation of the film concerning drunk driving. ($t=2.02$; $p<.025$, one tailed test).

Despite predictions to the contrary, there were no

significant correlations between locus of control and any of the factors on the Alcohol Expectancy Questionnaire. There was a low, albeit significant correlation between scores on the Children's Depression Inventory and the DLOC ($r=.14$; $p<.025$.). The relationship between the DLOC and the Crowne-Marlowe Social Desirability Scale was low (-.12) but again significant.

Discussion

The locus of control construct has been used in a wide variety of contexts to predict internal responsibility for the outcomes of individual behavior. Its use in the context of driving appeared appropriate from both a theoretical and practical standpoint. It would appear that a sense of responsibility for the consequences of one's own driving behavior would be a *sine qua non* for safe driving. For this reason a measure has been developed that has adequate psychometric properties. The DLOC is currently being used in a larger study aimed at developing an educational program to be used in high schools to teach sane, responsible driving. It is hoped that this instrument along with measures of drinking locus of control, stress and depression, will shed further light

on the inordinately high rate of adolescent alcohol-related traffic accidents.

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Table 1

Descriptive statistics for 43 participants based on DDBQ

Variable	% freq.	Response
1. Age	100	> 20 years old
2. GPA	65	2.51 to 3.5, based on 4.0
3. Memory of date rec'd driver's license	79	within 1 month of issuance
4. Freq. of driving	61	daily
5. Car ownership?	58	yes
6. Paid for car?	84	yes
7. Car accidents	51	none
	33	one
	16	two or more
8. Car size	30	compact or subcompact
	70	midsize or fullsize
9. Year of make	42	1975 or earlier
	58	1976 or later
10. Employed	65	yes
11. Car used in employment?	71	yes

Table 2

Descriptive statistics for 55 participants based on DDBQ-R

Variable	% freq.	Response
1. Age		M = 17.27 years, SD = .97
2. GPA	87	C+ or better
3. Extra-curr. activ's.	88	1 or more
4. # of home members		M = 3.58, SD = 1.6
5. Two parent family	69	yes
6. Drivers in home		M = 3.5, SD = 1.02
7. # of cars in home		M = 2.8, SD = 1.27
8. Licensed driver?	93	yes
9. Memory of date rec'd driver's license	79	remember exact month/day/year
10. Frequency of driving	53	everyday
	25	3 times per week
	16	once per week
11. When driving?	64	mostly weekends and evenings (high risk for accidents)
12. Car ownership?	33	yes
13. Paid for car?	16	yes
14. Car size	32	compact or subcompact
	12	truck or van

(table continued)

Table 2

Descriptive statistics for 55 participants based on DDBQ-R

Variable	% freq.	Response
15. Year of make	38	1975 or earlier
	62	1976 or later
16. Family SES		middle to upper SES
17. Father's moving violations	9	one in the past year
18. Mother's moving violations	11	one in the past year
19. In car when driver was intoxicated?	49	yes
20. Accid. as driver	20	1 or 2 accidents in past year
21. Accid as passenger	51	1-4 accidents in past year
22. Accid. as driver, involving police	20	9% were serious; 11% were minor
23. Accid. as passenger involving police	31	15% were serious; 16% were minor

Appendix A

INSTRUCTIONS: For each of the following questions, circle only one choice that best describes your ideas about driving. Remember you must circle only one choice.

Form A

4. If you hit a bicyclist and ruin the bike, it is because:
   a) the cyclist didn't use proper arm signals.
   b) you don't give bicyclists enough room.

7. If your engine doesn't overheat, it is because:
   a) the radiator is checked regularly.
   b) you live in a mild climate.

8. If your trailer comes unhitched while driving around a turn, it is because:
   a) you forgot to attach the safety chains.
   b) the U-Haul salesman gave you a defective trailer.

10. If you "rear-end" the car in front of you while accelerating after a stop light, it is because:
    a) the other driver brakes for no reason.
    b) you accelerated too quickly.

11. If you cannot avoid splashing muddy water on a pedestrian, it is because:
    a) you did not slow down enough.
    b) the pedestrian was standing too close to the road.

14. If your antennae is torn off by an automatic car washer, it is because:
    a) the bristles on the brush are too tough.
    b) you forgot to put it down before going in.

18. If you don't miss the shopping cart when parking, it is because:
    a) the other cars hide the cart.
    b) you don't look well enough.

24. If you don't have enough gas for the trip, it is because:
    a) you don't check the gas gauge.
    b) the directions you have are misleading.

27. If your windshield broke while following a gravel truck, it is because:
    a) you follow trucks too closely.
    b) the gravel on truck wasn't covered.

30. If you didn't avoid cutting off a fire truck, it is because:
    a) you weren't paying attention.
    b) traffic did not let you move out of the way.

31. If you sideswipe another car in heavy traffic, it is because:
    a) you are too impatient to slow down and wait for room.
    b) the car on the other side did not give you room.

36. If you cannot sell your car, it is because:
    a) no one likes that model.
    b) you haven't taken care of it.

39. If your brakes fail at a stop sign, it is because:
    a) the road is slippery.
    b) you approach stop signs too rapidly.

46. If you cannot avoid swerving off the road, it is because:
    a) you aren't paying attention.
    b) there is ice on the road.

47. If, when going around a turn, you drive onto a shoulder of the road, it is because:
    a) you are going too fast.
    b) the curve is too sharp.

Form B

48. If you can't avoid hitting a child's toy in the driveway, it is because:
    a) the toy is not supposed to be there.
    b) you don't look before you enter the driveway.

49. At night, if you miss a friend's driveway and drive onto the lawn, it is because:
    a) there aren't reflectors marking the way.
    b) you don't pay close enough attention and go too fast.

50. If you lose your gas cap at a filling station, it is because:
    a) the attendant didn't put it back on.
    b) you forgot to check and see that the attendant put the cap back on.

56. If you cannot avoid hitting somebody from behind, it is because:
    a) you were tailgating.
    b) he stopped too suddenly.

60. If you have transmission problems, it is because:
    a) you have a transmission fluid leak.
    b) you don't change the transmission fluid often enough.

61. If you skid off the road, it is more likely that:
    a) you aren't paying attention to road conditions.
    b) the city hasn't salted the streets.

65. If you get hurt while in a car, it is more likely that:
    a) the car is badly designed.
    b) for some reason you were not wearing your seat belt.

71. You are unable to avoid a fender-bender in a parking lot because:
    a) parking lots are always heavily congested.
    b) you aren't cautious enough.

76. If you are unable to avoid hitting a grocery cart while parking at a store, it is because:
    a) you are being careless.
    b) a car hid it from your view.

81. If you hit a patch of ice on the road and end up in the ditch, it is because:
    a) the ice was all over the road, so there was no way you could miss it.
    b) you were going too fast and weren't paying enough attention.

87. If a policeman stops you on the expressway, it is because:
    a) they are cracking down and trying to fill a quota.
    b) you've been going too fast.

89. If you cannot avoid scratching the car next to you while backing out of a parking space, it is because:
    a) you are not careful enough.
    b) the other driver has parked too close.

91. If a policeman catches you going 35 mph in a 25 mph zone, it is because:
    a) you are used to traveling too fast on that street.
    b) the speed limit on that street was recently changed.

95. You get pulled over by a cop who is near the school because:
    a) you have done something wrong.
    b) everyone is being pulled over.